Claims

1. A separator which is interposed between adjacent ones of a plurality of electrolyte assemblies each constructed of an electrolyte layer containing an electrolyte medium and a catalytic electrode disposed on a surface in a thickness-wise direction of the electrolyte layer, comprising:

a separating section for achieving separation between a fuel gas channel and an oxidizer gas channel; and

a sealing section disposed along an outer periphery of the separator, for preventing leakage of fuel gas and oxidizer gas,

wherein the separating section and the sealing section are formed integrally with each other by means of plastic deformation processing.

2. The separator of claim 1, wherein the separator is constituted by a metal sheet.

3. The separator of claim 1 or 2, wherein the separating section has a plurality of parallelly arranged U-shaped channels positioned in parallel with the surface of the electrolyte assembly on which the catalytic electrode is formed.

4. The separator of claim 1 or 2, wherein the sealing section has a sealing projection formed so as to extend in parallel with the surface of the electrolyte assembly on which the catalytic electrode is formed, a vertex of which is brought into pressure-contact with the electrolyte assembly under a resilient force.

5. The separator of any one of claims 1 to 4, wherein the separating section and the sealing section are formed by means of press working.

6. A separator which is interposed between adjacent ones of a plurality of electrolyte assemblies each constructed of an electrolyte layer containing an electrolyte medium and a catalytic electrode disposed on a surface in a thickness-wise direction of the electrolyte layer, comprising:

a separating section for achieving separation between a fuel gas channel and an oxidizer gas channel; and

a sealing section disposed along an outer periphery of the separator, for preventing leakage of fuel gas and oxidizer gas, the separating section and the sealing section being integrally formed with each other,

wherein a region corresponding to the sealing section is provided with a sealing projection which is formed so as to extend in parallel with the surface of the electrolyte assembly on which the catalytic electrode is formed, a vertex of which is brought into pressure-contact with the electrolyte assembly under a resilient force.

7. The separator of claim 6, wherein the separator is constituted by a metal sheet.

8. The separator of claim 6 or 7, wherein the sealing projection has, at least in its area to be contacted by the electrolyte layer, a high polymer elastic layer formed of an elastic body.

9. The separator of any one of claims 6 to 8, wherein the high polymer elastic layer has a width ranging from 1 to 10 mm and a thickness ranging from 1 to 100 μm.

10. The separator of any one of claims 6 to 9, wherein two or more pieces of the sealing projections are provided, with their vertices abutted against the electrolyte layer, and wherein, given that the location of abutment between the vertex and the electrolyte layer is imaginarily

indicated by an abutment line, the two or more abutment lines are arranged in parallel with each other.

11. The separator of any one of claims 6 to 10, further comprising an auxiliary projection analogous to the sealing projection formed in the region other than the sealing section and the separating section,

wherein the auxiliary projection is disposed in such a way as to make uniform the distribution of contact pressure which occurs between the separator and the electrolyte assembly at the time of assembly of the fuel cell including the separator.

12. A separator which is interposed between adjacent ones of a plurality of electrolyte assemblies each constructed of an electrolyte layer containing an electrolyte medium and a catalytic electrode disposed on a surface in a thickness-wise direction of the electrolyte layer, comprising:

a separating section formed of a metal sheet for achieving separation between a fuel gas channel and an oxidizer gas channel,

wherein the metal sheet has its surface coated with a rubber- or synthetic resin-made coating layer.

13. The separator of claim 12, wherein the rubber or synthetic resin material contained in the coating layer exhibits electrical conductivity.

14. The separator of claim 12 or 13, wherein the coating layer is so formed as to cover the surface of the metal sheet, with an adherent layer or a surface-treated layer lying therebetween.

15. The separator of any one of claims 12 to 14, wherein in a region of the coating layer which makes contact with the electrolyte assembly is formed a high conductive layer that is higher in electrical conductivity than the coating layer.

16. A method for manufacturing a separator which is interposed between adjacent ones of a plurality of electrolyte assemblies each constructed of an electrolyte layer containing an electrolyte medium and a catalytic electrode disposed on a surface in a thickness-wise direction of the electrolyte layer , the separator having a separating section formed of a metal sheet for achieving separation between a fuel gas channel and an oxidizer gas channel, the method comprising:

a processing step for subjecting the metal sheet

to plastic deformation processing to form the separating section; and

a coating step for applying a rubber or synthetic resin material on the surface of the deformation-processed metal sheet to form a coating layer.

17. A method for manufacturing a separator which is interposed between adjacent ones of a plurality of electrolyte assemblies each constructed of an electrolyte layer containing an electrolyte medium and a catalytic electrode disposed on a surface in a thickness-wise direction of the electrolyte layer, the separator having a separating section formed of a metal sheet for achieving separation between a fuel gas channel and an oxidizer gas channel, the method comprising:

a coating step for applying a rubber or synthetic resin material on the surface of the metal sheet to form a coating layer; and

a processing step for subjecting the metal sheet having the coating layer formed thereon to plastic deformation processing to form the separating section.

18. The method of claim 16 or 17, further comprising a step for forming a high conductive layer in a region of the coating layer which makes contact with the

electrolyte assembly, the high conductive layer being higher in electrical conductivity than the coating layer.